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09/928,348	08/14/2001	Takanobu Noguchi	Q65688	6677

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EXAMINER
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YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 04/09/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/928,348

Applicant(s)

NOGUCHI ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08/14/01, 12/21/01 & 04/12/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 sets forth that  $R_6$ - $R_{11}$  may be an "arylene" group having 6 to 20 carbon atoms. An arylene group is a divalent group whereas  $R_6$ - $R_{11}$  appear to represent monovalent groups. Clarification is required as to whether "arylene" actually means "aryl", or if the arylene group links the Si to which  $R_6$ - $R_{11}$  are attached to something else.

2. Regarding claim interpretation, the examiner interprets "each" in the phrase "each independently carrying" as recited in lines 12-13 of claim 1 as referring to each  $Ar_1$  rather than to each carbon atom in view of the later recitation "when [a] plurality of substituents are present on  $Ar_1$ ".

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Pei (US 2002/0193551 A1).

Pei discloses polymeric fluorescent substances wherein more than 9 mol% but less than 100 mol% of the repeating units are repeating units of present formula (1) wherein m represents 0 and Ar<sub>1</sub> represents an arylene group having 6 carbon atoms, the arylene group carrying one substituent of present formula (2) wherein X represents -NR<sub>5</sub>-, R<sub>5</sub> represents an aryl group having 6 carbon atoms (which is further substituted), and Ar<sub>2</sub> represents an aryl group having 6 carbon atoms which is substituted with an alkoxy group having 1 carbon atom. See the polymer represented by formula (XX) on page 10 and see the polymer prepared according to Example 7 on page 15. The polymer prepared according to Example 7 has a number-average molecular weight within the range set forth in present claim 1.

Pei's polymers are disclosed for use in the light emitting layer of an electroluminescent device.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reisch et al. in *Macromol. Chem. Phys.* Vol. 200, No. 3 (1999), pp. 552-561.

Reisch et al. disclose polymeric fluorescent substances similar to polymers within the scope of the present claims. See polymers represented by formulae 11a-e as shown on p. 554. Each of these polymers has a polystyrene reduced number-average molecular weight within the range set forth in present claim 1 (see the Table at the top of p. 554). Each of these polymers is a polymer in which 100% of the repeating units are units of present formula (1) wherein m represents 1, each of R<sub>1</sub> and R<sub>2</sub> represents hydrogen, and Ar<sub>1</sub> represents an arylene group having 6 carbon atoms, the arylene group carrying two substituents of present formula (2) wherein X represents -O- or -S- and Ar<sub>2</sub> represents an aryl group having 6 carbon atoms.

Prior art polymers 11a and 11d differ from the polymer of the present claims in that the aryl group represented by Ar<sub>2</sub> is not substituted whereas present claim 1 requires an aryl group represented by Ar<sub>2</sub> to be substituted by a substituent as described beginning in line 32 of claim 1.

Prior art polymers 11b, 11c and 11e differ from the polymer of the present claims in that the aryl group represented by Ar<sub>2</sub> is substituted with a substituent outside the scope of substituents recited in present claim 1. For prior art polymer 11b, the substituent on the aryl group is an unsubstituted aryl group having 6 carbon atoms whereas present claim 1 requires any aryl substituent on the aryl group represented by Ar<sub>2</sub> to have at least one substituent thereon (with no limitation on this further substituent). For prior art polymers 11c and 11e, the substituent on the aryl group is a branched alkyl group having 4 carbon atoms whereas present

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claim 1 requires any alkyl substituent on the aryl group represented by Ar<sub>2</sub> to have 5 to 20 carbon atoms.

The present specification contains no data that demonstrate that the presence of a substituent as described beginning in line 32 of claim 1 provides superior/unexpected results compared to similar polymers in which Ar<sub>2</sub> represents an unsubstituted aryl group or an aryl group substituted with substituents that are similar to, but outside the scope of, the substituents described in claim 1. Absent a showing of superior/unexpected results, it is the examiner's position that it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make polymers similar to those disclosed by Reisch et al. with the expectation that similar polymers would also be fluorescent. One of ordinary skill in the art would have been motivated to make similar polymers so as to obtain a variety of fluorescent polymers that could be used for Reisch's suggested purposes such as manufacture of conjugated polymer light-emitting diodes. See *In re Payne*, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 1979).

In the case of prior art polymers 11c and 11e, one of ordinary skill in the art would have reasonably expected that similar polymers having an alkyl substituent having 5 to 20 carbon atoms instead of the prior art's alkyl substituent having 4 carbon atoms would possess properties similar to those possessed by prior art polymers 11c and 11e. Homologs are generally of sufficiently close structural similarity that there is a presumed expectation of similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977).

With respect to present claims 3-7, one of ordinary skill in the art at the time of the invention would have been motivated to make a polymer light emitting device using the

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polymers disclosed by Reisch et al. and using polymers similar to those disclosed by Reisch et al. given Reisch's teachings as a whole. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use such a polymer light emitting device to provide light sources and displays in a manner as is known in the art.

7. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 6,329,086 B1).

Shi et al. disclose polymeric fluorescent substances wherein more than 9 mol% but less than 100 mol% of the repeating units are repeating units of present formula (1) wherein m represents 1, each of R<sub>1</sub> and R<sub>2</sub> represents hydrogen, and Ar<sub>1</sub> represents an arylene group having 6 carbon atoms, the arylene group carrying two substituents of present formula (2) wherein X represents -NR<sub>5</sub>-, R<sub>5</sub> represents an aryl group having 6 carbon atoms, and Ar<sub>2</sub> represents (i) a heterocyclic compound group having 5 carbon atoms, (ii) an aryl group having 6 carbon atoms which is substituted with an alkoxy group having 10 carbon atoms, or (iii) an aryl group having 6 carbon atoms which is substituted with an alkyl group having 6 carbon atoms. See the formulae for polymers 13, 25, 29, 31, 32, 40 and 41 in columns 13-24. (Polymer 32 also is a polymeric fluorescent substance wherein more than 9 mol % but less than 100 mol% of the repeating units are repeating units of present formula (1) wherein m represents 1, each of R<sub>1</sub> and R<sub>2</sub> represents hydrogen, and Ar<sub>1</sub> represents an arylene group having 6 carbon atoms, the arylene group carrying two substituents of present formula (2) wherein X represents -NR<sub>5</sub>-, R<sub>5</sub> represents a

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heterocyclic compound group having 5 carbon atoms, and Ar<sub>2</sub> represents an aryl group having 6 carbon atoms which is substituted with an alkyl group having 6 carbon atoms.)

The only limitation of present claim 1 that is not disclosed by Shi et al. is the number-average molecular weight limitation. Rather, Shi et al. disclose weight-average molecular weights. It is the examiner's position that it would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine suitable and optimum number-average molecular weights for Shi's polymers based on properties such as solubility and viscosity that are influenced by number-average molecular weight.

Shi's polymers are disclosed for use in the light emitting layer of an electroluminescent device. With respect to present claims 4-7, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use such a polymer light emitting device to provide light sources and displays in a manner as is known in the art.

8. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pei (US 2002/0193551 A1) as applied to claims 1 and 3 under 35 U.S.C. 102(e), and for the further reasons set forth below.

The polymer represented by formula (XX) on page 10 and the polymer prepared according to Example 7 are polymers comprising repeating units as required by the polymer of present claims 1 and 3-7. While the number-average molecular weight is disclosed for the polymer prepared according to Example 7, it is not disclosed for the polymer represented by formula (XX). It is the examiner's position that it would have been within the level of ordinary



skill of a worker in the art at the time of the invention to determine suitable and optimum number-average molecular weights for Pei's polymers based on properties such as solubility and viscosity that are influenced by number-average molecular weight.

Pei's polymers are disclosed for use in the light emitting layer of an electroluminescent device. With respect to present claims 4-7, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use such a polymer light emitting device to provide light sources and displays in a manner as is known in the art.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-7 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3 and 6-15 of U.S. Patent No. 6,521,359 B1.

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Although the conflicting claims are not identical, they are not patentably distinct from each other because there is substantial overlap between the polymeric fluorescent substances encompassed by the present claims and the patented claims.

11. Miscellaneous:

As grammatical corrections, --a-- should be inserted after “when” in line 14 of claim 1, “groups” should be changed to --group-- in line 19 of claim 1, --a-- should be inserted after “and” in line 20 of claim 1, and “groups” should be changed to --group-- in line 27 of claim 1.

Applicants are respectfully requested to verify whether the following terms as found in the specification are spelled correctly: “perirenyl” at p. 18, l. 13, and “phnazyl” and “phennthrolyl” at p. 24, l. 6 and at p. 26, l. 16.

Various occurrences of “naphthyl” and chemical names that include “naphthyl” as part of the name are misspelled as “naphtyl” in the specification. The examiner will correct these misspellings at such time as the application is otherwise in condition for allowance if not corrected by applicants prior to that time.

12. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

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The current fax numbers for Art Unit 1774 are (703) 872-9311 for official after final faxes and (703) 872-9310 or (703) 305-5408 for all other official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (703) 872-9041.)

MRY

04/05/03



**MARIE YAMNITZKY  
PRIMARY EXAMINER**

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